

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION**

October 20, 2011

**PERMIT TO INSTALL
25-11**

ISSUED TO
Michigan State University – T.B. Simon Power Plant

LOCATED AT
65 Service Drive
East Lansing, Michigan

IN THE COUNTY OF
Ingham

STATE REGISTRATION NUMBER
K3249

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Environmental Quality. This permit is hereby issued in accordance with and subject to Section 5505(1) of Article II, Chapter I, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Pursuant to Air Pollution Control Rule 336.1201(1), this permit constitutes the permittee's authority to install the identified emission unit(s) in accordance with all administrative rules of the Department and the attached conditions. Operation of the emission unit(s) identified in this Permit to Install is allowed pursuant to Rule 336.1201(6).

DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203:

July 14, 2011

DATE PERMIT TO INSTALL APPROVED:

October 20, 2011

SIGNATURE:

DATE PERMIT VOIDED:

SIGNATURE:

DATE PERMIT REVOKED:

SIGNATURE:

PERMIT TO INSTALL

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Common Abbreviations / Acronyms

Common Acronyms		Pollutant/Measurement Abbreviations	
AQD	Air Quality Division	BTU	British Thermal Unit
ANSI	American National Standards Institute	°C	Degrees Celsius
BACT	Best Available Control Technology	CO	Carbon Monoxide
CAA	Clean Air Act	dscf	Dry standard cubic foot
CEM	Continuous Emission Monitoring	dscm	Dry standard cubic meter
CFR	Code of Federal Regulations	°F	Degrees Fahrenheit
COM	Continuous Opacity Monitoring	gr	Grains
EPA	Environmental Protection Agency	Hg	Mercury
EU	Emission Unit	hr	Hour
FG	Flexible Group	H ₂ S	Hydrogen Sulfide
GACS	Gallon of Applied Coating Solids	hp	Horsepower
GC	General Condition	lb	Pound
HAP	Hazardous Air Pollutant	m	Meter
HVLP	High Volume Low Pressure *	mg	Milligram
ID	Identification	mm	Millimeter
LAER	Lowest Achievable Emission Rate	MM	Million
MACT	Maximum Achievable Control Technology	MW	Megawatts
MAERS	Michigan Air Emissions Reporting System	ng	Nanogram
MAP	Malfunction Abatement Plan	NO _x	Oxides of Nitrogen
MDEQ	Michigan Department of Environmental Quality (Department)	PM	Particulate Matter
MIOSHA	Michigan Occupational Safety & Health Administration	PM10	PM less than or equal to 10 microns diameter
MSDS	Material Safety Data Sheet	PM2.5	PM less than or equal 2.5 microns diameter
NESHAP	National Emission Standard for Hazardous Air Pollutants	pph	Pound per hour
NSPS	New Source Performance Standards	ppm	Parts per million
NSR	New Source Review	ppmv	Parts per million by volume
PS	Performance Specification	ppmw	Parts per million by weight
PSD	Prevention of Significant Deterioration	psia	Pounds per square inch absolute
PTE	Permanent Total Enclosure	psig	Pounds per square inch gauge
PTI	Permit to Install	scf	Standard cubic feet
RACT	Reasonably Available Control Technology	sec	Seconds
ROP	Renewable Operating Permit	SO ₂	Sulfur Dioxide
SC	Special Condition	THC	Total Hydrocarbons
SCR	Selective Catalytic Reduction	tpy	Tons per year
SRN	State Registration Number	µg	Microgram
TAC	Toxic Air Contaminant	VOC	Volatile Organic Compounds
TEQ	Toxicity Equivalence Quotient	yr	Year
VE	Visible Emissions		

* For High Volume Low Pressure (HVLP) applicators, the pressure measured at the HVLP gun air cap shall not exceed ten (10) pounds per square inch gauge (psig).

GENERAL CONDITIONS

1. The process or process equipment covered by this permit shall not be reconstructed, relocated, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule. **(R 336.1201(1))**
2. If the installation, construction, reconstruction, relocation, or modification of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the permittee or the designated authorized agent shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Environmental Quality, P.O. Box 30260, Lansing, Michigan 48909-7760, if it is decided not to pursue the installation, construction, reconstruction, relocation, or modification of the equipment allowed by this Permit to Install. **(R 336.1201(4))**
3. If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to R 336.1210, operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install. **(R 336.1201(6)(b))**
4. The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Department's rules or the Clean Air Act. **(R 336.1201(8), Section 5510 of Act 451, PA 1994)**
5. The terms and conditions of this Permit to Install shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by this Permit to Install. If the new owner or operator submits a written request to the Department pursuant to R 336.1219 and the Department approves the request, this permit will be amended to reflect the change of ownership or operational control. The request must include all of the information required by subrules (1)(a), (b), and (c) of R 336.1219 and shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environmental Quality. **(R 336.1219)**
6. Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property. **(R 336.1901)**
7. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the Department. The notice shall be provided not later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the Department within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal condition or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5). **(R 336.1912)**
8. Approval of this permit does not exempt the permittee from complying with any future applicable requirements which may be promulgated under Part 55 of 1994 PA 451, as amended or the Federal Clean Air Act.
9. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.
10. Operation of this equipment may be subject to other requirements of Part 55 of 1994 PA 451, as amended and the rules promulgated thereunder.

11. Except as provided in subrules (2) and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of R 336.1301, the permittee shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with R 336.1303. **(R 336.1301)**
 - a) A six-minute average of 20 percent opacity, except for one six-minute average per hour of not more than 27 percent opacity.
 - b) A visible emission limit specified by an applicable federal new source performance standard.
 - c) A visible emission limit specified as a condition of this Permit to Install.

12. Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in R 336.1370(2). **(R 336.1370)**

13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with R 336.2001 and R 336.2003, under any of the conditions listed in R 336.2001. **(R 336.2001)**

SPECIAL CONDITIONS

EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Installation Date / Modification Date	Flexible Group ID
EU-2-UNIT1	Dry bottom wall-fired, bituminous coal and biofuel fired boiler capable of generating 250,000 lb/hr of steam. This boiler is used to generate steam for the university and for the firing of a steam turbine to produce electricity. It is also capable of firing natural gas as a backup fuel. This boiler is equipped with overfire air and Selective Non-Catalytic Reduction (SNCR) which are to be used primarily during the ozone season to reduce NOx levels.	01/01/1965, 11/01/1978 10/20/2011	FG-2-UNIT1/2
EU-2-UNIT2	Dry bottom wall-fired, bituminous coal and biofuel fired boiler capable of generating 250,000 lb/hr of steam. This boiler is used to generate steam for the university and for the firing of a steam turbine to produce electricity. It is also capable of firing natural gas as a backup fuel. This boiler is equipped with overfire air and SNCR which are to be used primarily during the ozone season to reduce NOx levels.	01/01/1965, 11/01/1978 10/20/2011	FG-2-UNIT1/2,
EU-2-UNIT3	Dry bottom wall-fired, bituminous coal and biofuel fired boiler capable of generating 350,000 lb/hr of steam. The boiler can be used to generate process steam for the university and to generate steam for the firing of a steam turbine to produce electricity. The boiler is also capable of firing natural gas as a backup fuel. This boiler is equipped with overfire air and SNCR which are to be used primarily during the ozone season to reduce NOx levels.	03/15/1973, 01/01/1975 10/20/2011	NA
EU-2-UNIT4	Circulating fluidized bed capable of burning bituminous coal and biofuel and capable of generating 350,000 lb/hr of steam. The boiler is used to generate steam for the university and for the firing of a steam turbine to produce electricity. The boiler is capable of burning up to 30% (by weight) of biofuel material. The boiler also uses natural gas for ignition and as a backup fuel.	12/12/1990, 10/20/2011	NA
Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1290.			

The following conditions apply to: EU-2-UNIT3

DESCRIPTION:

Dry bottom wall-fired bituminous coal and biofuel fired boiler capable of generating 350,000 lb/hr of steam. The boiler can be used to generate process steam for the university and to generate steam for the firing of a steam turbine to produce electricity. The boiler is also capable of firing natural gas as a backup fuel. This boiler is equipped with overfire air and SNCR which are to be used primarily during the ozone season to reduce NOx levels.

Flexible Group ID:
 NA

POLLUTION CONTROL EQUIPMENT:

Electrostatic Precipitator, SNCR

I. EMISSION LIMITS

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. Particulate	0.10 Lbs/MMBTU heat input*	Test Protocol will specify averaging time	EU-2-UNIT3	V.1	(40 CFR Part 60.42(a)(1))
2. NOx	0.20 lbs/MMBTU heat input when firing natural gas	3-hr rolling average	EU-2-UNIT3	VI.4	(40 CFR Part 60.44(a)(1))
3. NOx	0.70 lbs/MMBTU heat input when firing solid fuel	3-hr rolling average	EU-2-UNIT3	VI.4	(40 CFR Part 60.44(a)(3))
4. SO ₂	1.2 lbs/MMBTU heat input when firing solid fuel**	3-hr rolling average	EU-2-UNIT3	VI.4	(40 CFR Part 60.43(a)(2))

*Compliance with this limit shall be considered compliance with the following applicable requirement which has been subsumed under this streamlined requirement: **R 336.1331(1)-Figure 31**

This is equivalent to 0.72% sulfur in coal at 12,000 BTU/lb based upon the weekly composite fuel analysis. Compliance with this limit shall be considered compliance with the following applicable requirement which has been subsumed under this streamlined requirement: **R 336.1401(1)-Table 42

II. MATERIAL LIMITS

Material	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. Biofuel	5% by weight of the total fuel combusted.	30 day rolling time period	EU-2-UNIT3	SC VI.5	R 336.1205(1)(a) and (b), R 336.1224, R 336.1901, R 336.1702

III. PROCESS/OPERATIONAL RESTRICTIONS

1. The permittee shall only combust natural gas and/solid fuel in EU-2-UNIT3. As used in this permit, “solid fuel” is defined as coal, biofuel, or coal/biofuel mixtures. Biofuel” includes agricultural residues (such as animal bedding, pelletized sugar beets, etc), a family of grasses, processed biofuels, non-chemically treated or coated wood, wood residue, bark, torrefied wood, or any derivative fuel or residue thereof, in any form, including but not limited to sawdust, sander dust, wood chips, scraps, slabs, millings, shavings, processed pellets made from wood and other forest residues. Biofuel does not include painted or chemically treated/coated construction or demolition waste. Biofuel does not include painted or chemically treated/coated construction or demolition waste. **(R 336.1225)**
2. Each transformer-rectifier set on the electrostatic precipitator shall be equipped with a saturable core reactor or silicon-controlled rectifier linear reactor. Each automatic controller shall be set to provide maximum power, or optimal power if operating in a sparking mode, from its respective transformer-rectifier set. **(R 336.1330(1))**
3. At least 30 days prior to burning any biofuel in the boiler, the permittee shall submit a Fuel Procurement Monitoring Plan (FPMP) to the AQD District Supervisor for and receive written approval from the AQD. The FPMP shall, at a minimum, specify the following:
 - a. A description of the fuel to be burned.
 - b. The source or supplier of the biofuel material.
 - c. Odor minimization measures to be taken, if required.

The permittee shall amend the FPMP within 45 days if any changes are deemed necessary or upon request by the AQD District Supervisor. The permittee shall submit the FPMP and any amendments to the AQD District Supervisor for review and approval. **(R 336.1205(1)(a) and (b), R 336.1224, R 336.1702, R 336.1901))**

4. Permittee shall not operate EG-2-UNIT3 boiler unless a Malfunction Abatement Plan for the electrostatic precipitator has been implemented and is maintained. **(R 336.1911)**

IV. DESIGN/EQUIPMENT PARAMETERS

1. Permittee shall not operate EU-2-UNIT3 unless the electrostatic precipitator is installed and operating properly. **(R 336.1910)**

V. TESTING/SAMPLING

Records shall be maintained on file for a period of 5 years. **(R 336.1201(3))**

1. The permittee shall verify the particulate emission from EU-2-UNIT3 by testing at owner's expense, in accordance with Department requirements. Testing will be required once every five years and may be coordinated with the RO permit renewal issuance. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD. The AQD must approve the final plan prior to testing. The permittee shall notify the District Supervisor or the Technical Programs Unit no less than 7 days prior to the anticipated test date. Verification of emission rates includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test. **(R 336.1331, R 336.2001, R 336.2003, R 336.2004)**

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of 5 years. **(R 336.1201(3))**

1. The permittee shall calibrate, maintain and operate a continuous opacity monitoring system (COM) to demonstrate compliance with the opacity limit for EU-2-UNIT3, in accordance with the procedures listed below:
 - a. The COMS shall be installed, calibrated, maintained, and operated in accordance with the procedures set forth in 40 CFR 60.13 and PS 1 of Appendix B, 40 CFR Part 60
 - b. The span value shall be 80, 90 or 100 percent
 - c. The permittee shall perform an annual audit of the COMS using the procedures set forth in USEPA Publication 450/4-92-010, "Performance Audits Procedures for Opacity Monitors", or a procedure acceptable to AQD. Within 30 days after the completion of the audit, the results of the annual audit shall be submitted to the AQD.
 - d. The COM shall complete a minimum of 1 cycle of sampling and analyzing for each successive 10-second period and 1 cycle of data recording for each successive 60-minute period.
(R 336.1301, R 336.2152(1), 40 CFR 60.45)
2. The permittee shall maintain records of each successive 6-minute opacity determination.
(40 CFR 60.45)
3. Records of all measurements including continuous monitoring system, monitoring device, and performance testing measurements; all continuous monitoring systems' performance evaluations; all continuous monitoring system or monitoring device calibration checks; and records of adjustments and maintenance performed on these systems or devices. **(R 336.1201(3), R 336.1911)**
4. The permittee shall calibrate, maintain and operate in a satisfactory manner a device to monitor and record the NO_x and SO₂ emissions for EU-2-UNIT3, on a continuous basis and according to the procedures outlined in Appendix 2-3. **(R 336.1201(3))**
5. The permittee shall monitor and maintain daily records on the following:
 - a. Amount of coal fired in EU-2-UNIT3 on a weight and percent weight basis.
 - b. Amount of natural gas fired in EU-2-UNIT3.
 - c. Amount of biofuel material fired in EU-2-UNIT3 on a weight and percent weight basis
 - d. Calendar date.

The permittee shall keep the above records on file at the facility, in a satisfactory manner, and available to the Department upon request. **(R 336.1205, R 336.1224, R 336.1702, R 336.1901)**

6. The 3-hour rolling average NO_x emission rate when firing a mixture of natural gas and solid fuel shall not exceed the applicable standard determined by proration using the following formula:²
$$PS_{NO_x} = (x(0.20) + z(0.70)) / (x+z)$$
Where:
 PS_{NO_x} = the prorated standard of NO_x in lb/MMBTU, based on a 3-hour rolling average determined each hour
x = the percentage of total heat input derived from natural gas, based on a 3-hour rolling average determined each hour
z = the percentage of total heat input derived from solid fuel, based on a 3-hour rolling average determined each hour
(40 CFR 60.44(b))

VII. REPORTING

1. The permittee shall submit two copies of an excess emission report (EER) and summary report for each CEMS in an acceptable format to the AQD, quarterly and in accordance with 40 CFR 60.7(c) & (d). All reports shall be postmarked by the 30th day following each calendar quarter. **(40 CFR 60.7)**

2. The permittee shall submit two copies of an excess emission report (EER) and summary report for the COMS in an acceptable format to the AQD, quarterly and in accordance with 40 CFR 60.7(c) & (d), as specified below:
- a. A report of each exceedance above the opacity limit. This includes the date, time, magnitude, cause and corrective actions of all occurrences during the reporting period.
 - b. A report of all periods of COMS downtime and corrective action.
 - c. A report of the total operating time of EU-2-UNIT3 during the reporting period.
 - d. If no exceedances or COMS downtime occurred during the reporting period, the permittee shall report that fact.
- All reports shall be postmarked by the 30th day following the end of each calendar quarter.
(40 CFR 60.7)

VIII. STACK/VENT RESTRICTIONS

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Diameter/Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVUNIT3/4	156	275	(R336.1201(3))

IX. OTHER REQUIREMENTS

NA

The following conditions apply to: EU-2-UNIT4

DESCRIPTION:

Circulating fluidized bed boiler firing bituminous coal, and biofuel capable of generating 350,000 lb/hr of steam. The boiler is used to generate steam for the university and for the firing of a steam turbine to produce electricity. The boiler is capable of burning up to 30% (by weight) of biofuel material. The boiler also uses natural gas for ignition and as a backup fuel.

Flexible Group ID:

NA

POLLUTION CONTROL EQUIPMENT:

Baghouse collector for particulate control
 Selective non-catalytic reduction (SNCR) system for nitrogen oxide control
 Limestone injection for sulfur dioxide control

I. EMISSION LIMITS

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. Opacity	10%, except one 6-minute average per hour of not more than 20%	6-minute average	EG-2-UNIT4	VI.1	(40 CFR 52.21(j))
2. Particulate Matter	0.03 lbs/MM BTU heat input	Test Protocol**	EG-2-UNIT4	V.1, VI.1	(40 CFR 52.21(j))
3. Particulate Matter	13.8 lbs/hr	Test Protocol**	EG-2-UNIT4	V.1, VI.1	(40 CFR 52.21(j))
4. NO _x	0.16 lbs/MM BTU heat input when firing solid fuel	24-hr rolling average	EG-2-UNIT4	VI.2	(40 CFR 52.21(j))
5. NO _x	73.6 lbs/hr when firing solid fuel	24-hr rolling average	EG-2-UNIT4	VI.2	(40 CFR 52.21(j))
6. NO _x	0.076 lbs/MM BTU heat input when firing natural gas	24-hr rolling average	EG-2-UNIT4	VI.2	(40 CFR 52.21(j))
7. NO _x	32.2 lbs/hr when firing natural gas	24-hr rolling average	EG-2-UNIT4	VI.2	(40 CFR 52.21(j))
8. SO ₂	0.60 lbs/MM BTU heat input when firing solid fuel	30-day rolling average	EG-2-UNIT4	VI.2	(40 CFR 52.21(j))
9. SO ₂	0.74 lbs/MM BTU heat input when firing solid fuel	24-hr rolling average	EG-2-UNIT4	VI.2	(40 CFR 52.21(j))
10. SO ₂	4.09 tons/day	24-hr rolling average	EG-2-UNIT4	VI.2	(40 CFR 52.21(j))
11. SO ₂	1208.9 tpy	12-month rolling average	EG-2-UNIT4	VI.2	(40 CFR 52.21(j))

Pollutant	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
12. CO	0.20 lbs/MM BTU heat input excluding periods of startup and shutdown	24-hr rolling average	EG-2-UNIT4	VI.2	(40 CFR 52.21(j))
13. CO	92 lbs/hr	24-hr rolling average	EG-2-UNIT4	VI.2	(40 CFR 52.21(j))
14. Hydrocarbons (non-methane)	9.2 lbs/hr	monthly average	EG-2-UNIT4	VI.3	(40 CFR 52.21(j))
* Compliance with this requirement, 40 CFR 52.21(j), shall be considered compliance with the standards specified in NSPS, 40 CFR Part 60, Subpart Db (60.42b for SO ₂ , 60.43b for particulate and 60.44b for NO _x), which has been subsumed under this streamlined requirement.					
** Test protocol will specify averaging time period					

15. The 24-hour rolling average NO_x emission rate when firing a mixture of natural gas and coal shall not exceed the applicable standard determined by proration using the following formula:

$$PS_{NO_x} = (x(0.076) + z(0.16)) / (x+z)$$

Where:

PS_{NO_x} = the prorated standard of NO_x in lb/MMBTU, based on a 24-hour rolling average determined each hour

x = the percentage of total heat input derived from natural gas, based on a 24-hour rolling average determined each hour

z = the percentage of total heat input derived from coal, based on a 24-hour rolling average determined each hour.

(40 CFR 60.44b(b), 40 CFR 52.21(j))

16. The SO₂ emission rate from EU-2-UNIT4 shall not be in excess of 10 percent of the potential SO₂ emission rate based upon a 30 day rolling time period. The “potential SO₂ emission rate” means the theoretical emissions (lb/MMBTU heat input) that would result from the combustion of a fuel in an uncleaned state without an emissions control system. **(40 CFR 60.42b(a))**

II. MATERIAL LIMITS

Material	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. Biofuel	30% by weight of the total fuel combusted.	30-day rolling time period	EU-2-UNIT4	VI.5	R 336.1205(1)(a) and (b), R 336.1224, R 336.1901, R 336.1702

III. PROCESS/OPERATIONAL RESTRICTIONS

1. The permittee shall only combust natural gas and/solid fuel in EU-2-UNIT4. As used in this permit, “solid fuel” is defined as coal, biofuel, or coal/biofuel mixtures. Biofuel” includes agricultural residues (such as animal bedding, pelletized sugar beets, etc), a family of grasses, processed biofuels, non-chemically treated or coated wood, wood residue, bark, torrefied wood, or any derivative fuel or residue thereof, in any form, including but not limited to sawdust, sander dust, wood chips, scraps, slabs, millings, shavings, processed pellets made from wood and other forest residues. Biofuel does not include painted or chemically

treated/coated construction or demolition waste. Biofuel does not include painted or chemically treated/coated construction or demolition waste. **(R 336.1225)**

2. Within 60-days after permit issuance, the permittee shall submit a Fuel Procurement Monitoring Plan (FPMP) to the AQD District Supervisor for and receive written approval from the AQD. The FPMP shall, at a minimum, specify the following:
 - a. A description of the fuel to be burned.
 - b. The source or supplier of the biofuel material.
 - c. Odor minimization measures to be taken, if required.

The permittee shall amend the FPMP within 45 days if any changes are deemed necessary or upon request by the AQD District Supervisor. The permittee shall submit the FPMP and any amendments to the AQD District Supervisor for review and approval. **(R 336.1205(1)(a) and (b), R 336.1224, R 336.1702, R 336.1901)**

3. The permittee shall not operate EU-2-UNIT4 unless a Malfunction Abatement Plan for EU-2-UNIT4 has been implemented and maintained. **(R 336.1911)**
4. The permittee shall not operate EU-2-UNIT4 unless a Malfunction Abatement Plan for the fabric filter baghouse has been implemented and is maintained. Any changes made to the Fabric Filter Baghouse Malfunction Abatement Plan last revised October 23, 1998 must have prior approval by the Lansing District Supervisor prior to implementation. **(R 336.1911)**

IV. DESIGN/EQUIPMENT PARAMETERS

1. The permittee shall not operate EU-2-UNIT4 unless the SNCR system and baghouse are installed and operating properly. **(R 336.1910)**

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall verify the particulate emission from EU-2-UNIT4 by testing at owner's expense, in accordance with Department requirements. Testing will be required once every five years and may be coordinated with the RO permit renewal issuance. No less than 30 days prior to testing, the permittee shall submit a complete test plan to the AQD. The AQD must approve the final plan prior to testing. The permittee shall notify the District Supervisor or the Technical Programs Unit no less than 7 days prior to the anticipated test date. Verification of emission rates includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test. **(R 336.1331, R 336.2001, R 336.2003, R 336.2004, 40 CFR 52.21(j))**
2. The permittee shall create a daily composite fuel sample for EU-2-UNIT4 collected during periods when the Unit 4 coal bunker is being filled. Samples shall consist of grab samples from the flowing over bunker coal belt, taken every five minutes while the solid fuel is being loaded into the bunker. The daily composite fuel sample shall be analyzed to determine % sulfur content, BTU's/lb, and the calculated % sulfur adjusted to 11,000 BTU. The coal shall be sampled in accordance with ASTM D2234. The percent sulfur content of the coal shall be analyzed in accordance with ASTM D3177. **(R 336.1201(3))**
3. The permittee shall conduct random sampling of coal from railcars and trucks using flowing belt sampling at the bunker coal feed. This analysis shall be used to check the supplier's analysis. The coal shall be sampled in accordance with ASTM D2234. The percent sulfur content of the coal shall be analyzed in accordance with ASTM D3177. **(R336.1201(3))**

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall calibrate, maintain, and operate a continuous opacity monitoring system (COM), in accordance with the procedures outlined below and in 40 CFR 60.48b: **(40 CFR 60.48b)**
 - a. The COM shall complete a minimum of 1 cycle of sampling and analyzing for each successive 10-second period and 1 cycle of data recording for each successive 6-minute period. **(R336.2152(1))**
 - b. The span value of the COM shall be between 60 and 80%. **(40 CFR 60.48b(e)(1))**
2. The permittee shall calibrate, maintain, and operate a continuous emission monitoring system (CEMS) to monitor and record the NO_x, CO, SO₂ and CO₂ or O₂ emissions for EU-2-UNIT4, on a continuous basis and according to the procedures outlined below and in Appendix 2-3: **(R336.1201(3))**
 - a. The CEMS shall complete a minimum of 1 cycle of operation for each successive 15-minute period. **(R336.2152(2))**
 - b. The permittee shall check the zero and span calibration drifts for all CEM systems, at least once daily, and make the appropriate adjustments in accordance with the manufacturer's written procedure. **(40 CFR 60.13(d))**
3. The following data and calculations will be maintained as a record:
 - a. Each successive 6-minute opacity determination. **(40 CFR 60.49b(f))**
 - b. The 24-hour rolling average NO_x and particulate emission rates in terms of pounds per million BTU heat input and pounds per hour. **(40 CFR 52.21(j))**
 - c. The 24-hour rolling average (in pounds per million BTU and tons per day), 30-day rolling average (in pounds per million BTU) and 12-month rolling average (in tons per year) SO₂ emission rates. **(40 CFR 52.21(j))**
 - d. The 24-hour rolling average (in pounds per million BTU) and 24-hour rolling average (in pounds per hour) CO emission rates. **(40 CFR 52.21(j))**
 - e. The monthly calculated VOC emission rate using actual hours of operation. **(40 CFR 52.21(j))**
4. Records of all measurements including continuous monitoring system, monitoring device, and performance testing measurements; all continuous monitoring systems performance evaluations; all continuous monitoring system or monitoring device calibration checks; and records of adjustments and maintenance performed on these systems or devices. **(R 336.1201(3))**
5. The Permittee shall monitor and maintain daily records on the following:
 - a. Amount of coal fired in EU-2-UNIT4 on a weight and percent weight basis.
 - b. Amount of natural gas fired in EU-2-UNIT4.
 - c. Amount of biofuel material fired in EU-2-UNIT4 on a weight and percent weight basis
 - d. Calendar date.

The permittee shall keep the above records on file at the facility, in a satisfactory manner, and available to the Department upon request. **(R 336.1205, R 336.1224, R 336.1702, R 336.1901)**
6. Records of the occurrence and duration of any startup, shutdown, or malfunction in the operation; any malfunction of the air pollution control equipment, or any periods during which a continuous monitoring system or monitoring device is inoperative. **(40 CFR 60.7)**
7. The permittee shall monitor and record the pressure drop across the baghouse collector at least once each calendar day in a manner and with instrumentation acceptable to the Air Quality Division. **(R 336.1201(3))**
8. The permittee shall determine the percent of SO₂ reduction based on fuel sulfur content determined on a daily basis and SO₂ CEM data. A 30-day rolling average SO₂% reduction shall be calculated from each day's fuel sulfur content and CEM data when firing coal. This calculation will be used to determine compliance of Condition 16 in Section I of this table. **(40 CFR 60.42b(a))**

VII. REPORTING

1. Quarterly reporting of the "Excess Emission and Monitoring Systems Performance Report" and the "Summary Report" as specified in 40 CFR 60.7 (c) and (d) for opacity, NOx, CO, and SO₂ (excess emissions shall be based on the limits identified in Section I). Due April 30 for reporting period January 1 to March 31, July 30 for reporting period April 1 to June 30, October 30 for reporting period July 1 to September 30, and January 30 for reporting period October 1 to December 31. **(40 CFR 60.7)**
2. Quarterly reporting of the "Data Assessment Report" as set forth in Appendix F of 40 CFR 60 for the CEMs. Due April 30 for reporting period January 1 to March 31, July 30 for reporting period April 1 to June 30, October 30 for reporting period July 1 to September 30, and January 30 for reporting period October 1 to December 31. **(40 CFR 60.7)**

VIII. STACK/VENT RESTRICTIONS

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Diameter/Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVUNIT3/4	156	275	(R336.1201(3))

IX. OTHER REQUIREMENTS

1. The permittee shall notify the AQD of any physical or operational change which may increase the emission rate of any pollutant to which a standard applies, unless that change is specifically exempted. This notice shall be postmarked 60 days, or as soon as practical, before the change is commenced and shall include information on describing the precise nature of the change, present and proposed emission control systems, productive capacity before and after the change, and the expected completion date of the change. **(40 CFR 60.7)**

FLEXIBLE GROUP SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Flexible Group ID	Flexible Group Description	Associated Emission Unit IDs
FG-2/-UNIT1/2	Two dry bottom wall-fired bituminous coal fired and biofuel boilers capable of generating 250,000 lb/hr of steam each. The boilers are used to generate steam for the university and for the firing of a steam turbine to produce electricity (CHP). The boilers are also capable of firing natural gas as a backup fuel. The boilers are equipped with overfire air and SNCR which are to be used primarily during the ozone season to reduce NOx levels.	EU-2-UNIT1, EU-2-UNIT2
FGFACILITY	All process equipment source-wide including equipment covered by other permits, grand-fathered equipment and exempt equipment.	

The following conditions apply to: FG-2-UNIT1/2

DESCRIPTION:

Two dry bottom wall-fired bituminous coal fired boilers capable of generating 250,000 lb/hr of steam each. The boilers are used to generate steam for the university and for the firing of a steam turbine to produce electricity (CHP). The boilers are also capable of firing biofuel and natural gas (as a backup fuel). The boilers are equipped with overfire air and SNCR (Selective Non-Catalytic Reduction) which are to be used primarily during the ozone season to reduce NOx levels.

Emission Units: EU-2-UNIT1, EU-2-UNIT2

POLLUTION CONTROL EQUIPMENT:

Baghouse collectors
 Low-NO_x burners
 SNCR

I. EMISSION LIMITS

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. PM	0.25 lbs/1000 lbs exhaust gases, corrected to 50% excess air	Test Protocol	FG-2-UNIT1/2	GC 13	(R 336.1331(1), Figure 31)

II. MATERIAL LIMITS

Material	Limit	Time Period / Operating Scenario	Equipment	Testing / Monitoring Method	Underlying Applicable Requirements
1. Biofuel material	5% by weight of the total fuel combusted	30-day rolling time period	EU-2-UNIT1/2	VI.6	R 336.1205(1)(a) and (b), R 336.1224, R 336.1901, R 336.1702
2. SO ₂	1.5% sulfur in coal at 12,000 BTU/lb	24-hour rolling average	FG-2-UNIT1/2	V.1, V.2	(R 336.1401(1), Table 41)

III. PROCESS/OPERATIONAL RESTRICTIONS

1. The permittee shall only combust natural gas and/solid fuel in EU-2-UNIT1/2. As used in this permit, “solid fuel” is defined as coal, biofuel, or coal/biofuel mixtures. Biofuel” includes agricultural residues (such as animal bedding, pelletized sugar beets, etc), a family of grasses, processed biofuels, non-chemically treated or coated wood, wood residue, bark, torrefied wood, or any derivative fuel or residue thereof, in any form, including but not limited to sawdust, sander dust, wood chips, scraps, slabs, millings, shavings, processed pellets made from wood and other forest residues. Biofuel does not include painted or chemically treated/coated construction or demolition waste. Biofuel does not include painted or chemically treated/coated construction or demolition waste. **(R 336.1225)**

2. Input solid fuel feed to EU-2-UNIT1 and/or EU-2-UNIT2 shall cease immediately, consistent with safe operating procedures, upon initiation of collector bypass. Input solid fuel feed to EU-2-UNIT1 and/or EU-2-UNIT2 shall not restart until the collector(s) are back on line. **(R 336.1201(3))**
3. The permittee shall not operate either EU-2-UNIT1 or EU-2-UNIT2 unless a Malfunction Abatement Plan for the fabric filter baghouse collectors has been implemented and is maintained for both units. **(R 336.1911)**
4. At least 30 days prior to burning any biofuel in EU-2-UNIT1 and/or EU-2-UNIT2, the permittee shall submit a Fuel Procurement Monitoring Plan (FPMP) to the AQD District Supervisor for written approval. The FPMP shall, at a minimum, specify the following:
 - a. A description of the fuel to be burned.
 - b. The source or supplier of the biomass material.
 - c. Odor minimization measures to be taken, if required.

The permittee shall amend the FPMP within 45 days if any changes are deemed necessary or upon request by the AQD District Supervisor. The permittee shall submit the FPMP and any amendments to the AQD District Supervisor for review and approval. **(R 336.1205(1)(a) and (b), R 336.1224, R 336.1702, R 336.1901)**

IV. DESIGN/EQUIPMENT PARAMETERS

1. Each baghouse collector shall be equipped with a pressure drop indicator. **(R 336.1201(3))**

V. TESTING/SAMPLING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall create a daily composite fuel sample for EU-2-UNIT1 and EU-2-UNIT2 created from 24 hourly samples collected during periods when coal is combusted. The daily composite fuel sample shall be analyzed to determine % sulfur content, % ash by weight, % moisture (H₂O) by weight, BTU's/lb, and the calculated % sulfur adjusted to 11,000 BTU. The 24 hourly samples shall consist of grab samples taken from the flowing coal belt. The coal shall be sampled in accordance with ASTM D2234. The percent sulfur content of the coal shall be analyzed in accordance with ASTM D3177. **(R 336.1401)**
2. The permittee shall conduct random sampling of coal from railcars and trucks using flowing belt sampling at the bunker coal feed. This analysis shall be used to check the supplier's analysis. The coal shall be sampled in accordance with ASTM D2234. The percent sulfur content of the coal shall be analyzed in accordance with ASTM D3177. **(R 336. 1401)**

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall calibrate, maintain, and operate a continuous opacity monitoring (COM) system, in accordance with procedures under 40 CFR 60.13, for measuring and recording the opacity of emissions discharged from EU-2-UNIT1 and EU-2-UNIT2. The permittee shall use COM data to determine compliance with the opacity limit. **(R 336.1201(3))**
2. Each COM shall comply with the following:
 - a. Performance Specification 1 of Appendix B, 40 CFR Part 60. **(R 336.1201(3))**
 - b. Each COM shall complete a minimum of 1 cycle of sampling and analyzing for each successive 10-second period and 1 cycle of data recording for each successive 6-minute period. **(R 336.2152(1))**
 - c. Permittee shall check the zero and span calibration drifts of each COM, at least once daily and make the adjustments in accordance with the manufacturer's written procedure. **(R 336.1201(3))**
 - d. The span value of the COM shall be 80, 90, or 100%. **(R 336.1201(3))**
3. The permittee shall maintain records of each successive 6-minute opacity determination. **(R 336.1201(3))**

4. The permittee shall maintain the following records on a daily basis: **(R 336.1201(3))**
 - a. Calendar date
 - b. Hours of operation
 - c. The magnitude, in actual percent opacity, of all 6-minute averages of opacity greater than 20% and the time represented by such averages.
 - d. Identification of days when COM data was not obtained, including a reason for not obtaining the data and a description of corrective actions taken.
 - e. Identification of times when COM data was excluded from as average opacity calculation and a reason why data was excluded.
 - f. Identification of times when the opacity reading exceeded full span of the COM system.
5. Records of all measurements including: COM performance testing measurements; all COM performance evaluations; all COM calibration checks; and records of adjustments and maintenance performed on these systems or devices. **(R 336.1201(3))**
6. The permittee shall monitor and maintain daily records on the following:
 - a. Amount of coal fired in EU-2-UNIT1 and EU-2-UNIT2 on a weight and percent weight basis.
 - b. Amount of natural gas fired in EU-2-UNIT1 and EU-2-UNIT2.
 - c. Amount of biofuel fired in EU-2 –UNIT1 and EU-2-UNIT2 on a weight and percent weight basis.
 - d. Calendar date.

The permittee shall keep the above records on file at the facility, in a satisfactory manner, and available to the Department upon request. (R336.1205, R336.1224, R336.1702, R336.1901)

VII. REPORTING

1. Quarterly reporting of the "Excess Emission and Monitoring Systems Performance Report" and the "Summary Report" as specified in 40 CFR 60.7 (c) and (d) for opacity (excess opacity shall be based on above 20% opacity). Due April 30 for reporting period January 1 to March 31, July 30 for reporting period April 1 to June 30, October 30 for reporting period July 1 to September 30, and January 30 for reporting period October 1 to December 31. **(40 CFR 60.7)**

VIII. STACK/VENT RESTRICTIONS

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Diameter/Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVUNIT1/2	132	275	(R 336.1201(3))

IX. OTHER REQUIREMENTS

NA